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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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08/02/2001

Roger L. Schultz

990114 UI USA

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7590

10/18/2004

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EXAMINER

DANG, HUNG Q

ART UNIT

PAPER NUMBER

2635

DATE MAILED: 10/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/921,118

Applicant(s)

SCHULTZ, ROGER L.

Examiner

Hung Q Dang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-14 and 20-23 is/are allowed.
- 6) ☒ Claim(s) 15-18 and 24-28 is/are rejected.
- 7) ☒ Claim(s) 19 and 27 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/12/01;3/12/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Claim Objections***

1. Claim 27 is objected to because of the following informalities: Claim 5 contains the terms "capable of". It has been held that the recitation that an element is "capable of" performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138. Therefore, the claimed limitation "the adaptive transmitter controller capable of mathematically modeling the acoustic effects of the transmitter and the acoustic channel" will not be given any patentable weight. Appropriate correction is required.

Drawings

2. The drawings are objected to because all the boxes in figures 2 and 3 lack of descriptive labels. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the

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remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 15, 16, 18, 23, 27 and 28 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 16 of U.S. Patent No. 6,434,084. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

Claims 15 and 23 of this application and claim 16 of U.S. Patent No. 6,434,084 both, in principle, teach a method of transmitting data in an oil well environment comprising the steps of:

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transmitting signals from a transmitter into an acoustic channel;
detecting the corresponding transmitted signals and inputting the
transmitted signals into an adaptive transmitter controller; and
utilizing the adaptive transmitter controller to optimally drive the
transmitter by adaptively modifying later-transmitted data signals to
counteract the distorting effects of the transmitter and acoustic channel on the
transmitted signals.

Even though, Claim 16 of U.S. Patent 6,434,084 does not specifically
indicate said transmitted signal is a **data** transmitted signal, however, one skilled
in the art would recognize that said transmitted data signal is used to determine
the distorted pattern when said transmitted data signal is transmitted through
said acoustic channel so that latter data signals can be pre-distorted prior to be
transmitted to counteract the distortion effect caused by interference in said
acoustic channel. Therefore, transmitting a data signal or an acoustic "test"
signal along said acoustic channel would be functionally equivalent.

Regarding claim 16, claim 16 of U.S. Patent 6,434,084 also implies the
step of receiving the later sent signals at a remote location along the acoustic
channel.

Regarding claim 18, the "system identification model", as described on
lines 6-11 of page 10 of the specification, the system identification model is
designed to produce a mathematical function to eliminate or reduce the system
error utilizing an interactive mathematical process. Claim 16 of U.S. Patent
6,434,084 also implies eliminating error by utilizing an mathematical process.

Regarding claim 27, claim 16 of U.S. Patent 6,434,084 also teaches an adaptive transmitter controller (same as adaptive equalizer) capable of mathematically modeling the acoustic effects of the transmitter and the acoustic channel.

Regarding claim 28, even though claim 16 of U.S. Patent 6,434,084 does not specifically mention that said acoustic receiver is connected to the adaptive transmitter controller (adaptive equalizer) by a wireline, however, one skilled in the art would recognize that said receiver and said controller needs to be connected somehow, and using wireline is one of the conventional method to connect such components for data transfer. Therefore, by conventionality, it would have been obvious to one skilled in the art to provide a wireline connecting the acoustic receiver and the adaptive transmitter controller (adaptive equalizer) disclosed by claim 16 of U.S. Patent 6,434,084.

5. **Claims 17 and 26** are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 17 of U.S. Patent No. 6,434,084. Although the conflicting claims are not identical, they are not patentably distinct from each other because both the “adaptive transmitter control” and the “adaptive equalizer” are used to counteract the distorting effects of the transmitter and acoustic channel on the transmitted channel.

6. **Claim 25** is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 21 of U.S.

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Patent No. 6,434,084 because they both claim another acoustic receiver placed along the acoustic channel at a remote location.

Allowable Subject Matter

7. Claims 1-14 and 20-23 are allowed.

Regarding claim 1, the prior arts of record fail to teach or disclose a method of data transmission in an oil well environment as claimed in claim 1, the method comprising the steps of providing a reference data signal to an adaptive transmitter controller having an acoustic transmitter; transmitting an acoustic reference signal, corresponding to data signal, from an acoustic transmitter at first location along an acoustic channel; detecting the acoustic reference signal at a second location along the acoustic channel, the acoustic reference signal distorted from the acoustic effects of the transmitter and the acoustic channel; generating a measured reference data signal in response to the detected acoustic reference signal; inputting the measured reference data signal to the adaptive transmitter controller; and utilizing the adaptive transmitter controller to optimally drive the acoustic transmitter by providing modified reference data signals for transmission, the modified reference data signals related to the reference data signal by a mathematical function and selected to counteract the distorting acoustic effects of the transmitter and acoustic channel.

Regarding claim 20, the prior arts of record fail to teach or disclose a method of data transmission in an oil well environment as claimed in claim 1, the method comprising the steps of providing a reference data signal to an adaptive

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transmitter controller having an acoustic transmitter; transmitting an acoustic reference signal, corresponding to data signal, from an acoustic transmitter at first location along an acoustic channel; detecting the acoustic reference signal at a second location along the acoustic channel, the acoustic reference signal distorted from the acoustic effects of the transmitter and the acoustic channel; generating a measured reference data signal in response to the detected acoustic reference signal; inputting the measured reference data signal to the adaptive transmitter controller; and utilizing the adaptive transmitter controller to find a reference signal error and to optimally drive the acoustic transmitter by providing modified data signals for transmission along the acoustic channel, the modified data signals having corresponding modified signal errors upon detection at the second location along the acoustic channel, the modified data signals selected to minimize the corresponding modified signal errors.

8. **Claim 19** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior arts of record fail to teach or suggest a method for transmitting data in an oil well environment as claimed in claim 16, wherein the step of detecting comprises placing an acoustic receiver along the acoustic channel at a testing location, the testing location is closer to the transmitter than the remote location.

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Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Q Dang whose telephone number is (571) 272-3069. The examiner can normally be reached on 9:30AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Horabik can be reached on (571) 272-3068. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HD

MICHAEL HORABIK
SUPERVISORY EXAMINER
TECHNOLOGY CENTER 2600

